Physics-based cues for accurate 3D shape and reflectance estimation

Taishi Ono, Sony Europe B.V.

Recently, there has been a surge in demand for training datasets for Computer Vision applications in the field of Smart Retail, -logistics, -city, and -factory. Due to the lack of large publicly available datasets for these novel applications, synthetic dataset generation with realistic object appearance has gained popularity. Rendering realistic images requires accurate shape and reflectance property estimation of the object. This is a challenge due to a wide variety of shapes and materials (from diffuse to highly glossy) in the real world. In this presentation, we introduce three different techniques for shape and reflectance estimation, which consider how to integrate physics-based cues into NeRF-based models. We show the capability of these techniques, and further talk about their potential use cases.